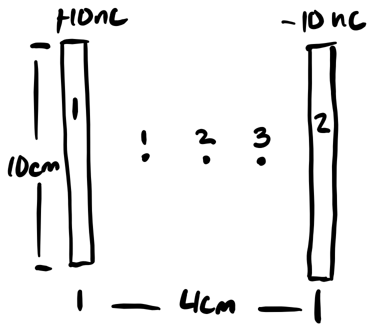
P: 8 & 36
CQ: 3
Ch. 26

26.P.8



E_1 : $\underset{+}{E_1} = 1.76\times10^{5}\ N/C$

$\lambda = \dfrac{|+10\times10^{-9}C|}{10\times10^{-2}m} = +1.0\times10^{-7}\ C/m$

$K = 8.99\times10^{9}\ Nm^2/c^2$

$r = 1.0\times10^{-2}m$

$L = 10\times10^{-2}m$

$\underset{-}{E_1} = +5.14\times10^{4}\ N/C$

$\lambda = \left|\dfrac{-10\times10^{-9}C}{10\times10^{-2}m}\right|$

$K = 8.99\times10^{9}\ Nm^2/c^2$

$r = 3.0\times10^{-2}m$

$L = 10\times10^{-2}m$

$$E_{rod} = \frac{2K\lambda}{r\sqrt{1+4r^2/L^2}}$$

$\lambda = \dfrac{Q}{L}$

r = distance to point

E_2 : $\underset{+}{E_2} = 83{,}470.1\ N/C = \underset{-}{E_2}$

$\lambda = \dfrac{|10\times10^{-9}C|}{10\times10^{-2}m}$

$r = 2.0\times10^{-2}m$

$L = 10\times10^{-2}m$

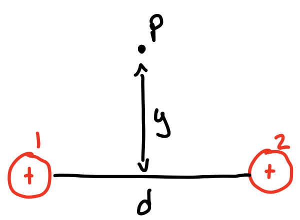
$E_2 = 2\underset{+}{E_2} = 1.67\times10^{5}\ N/C$

$E_1 = 2.27\times10^{5}\ N/C$

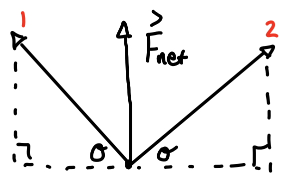
$E_2 = 1.67\times10^{5}\ N/C$

$E_3 = 2.27\times10^{5}\ N/C$

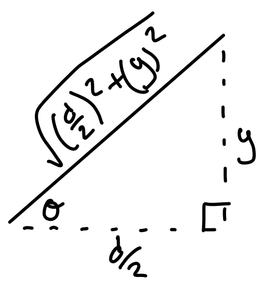
26.P.36



$$E_{Line} = \frac{2K\lambda}{r}$$



x-components will cancel out due to symmetry.



$$\sin\theta = \frac{y}{\sqrt{(\frac{d}{2})^2+(y)^2}}$$

$E_{1y} = E_1\sin\theta$

$$E_{1y} = \frac{2K\lambda}{\sqrt{(\frac{d}{2})^2+y^2}}\sin\theta$$

$E_{2y} = E_2\sin\theta$

$$E_{2y} = \frac{2K\lambda}{\sqrt{(\frac{d}{2})^2+y^2}}\sin\theta$$

$E_{net} = E_1 + E_2$

$\underset{0}{E_{1x}} + E_{1y}$ $\quad$ $\underset{0}{E_{2x}} + E_{2y}$

$E_{1y} + E_{2y}$

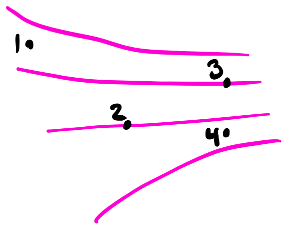
$E_{net} = E_{1y} + E$

$$\frac{2K\lambda}{\sqrt{(\frac{d}{2})^2+y^2}}\left(\frac{y}{\sqrt{(\frac{d}{2})^2+y^2}}\right) + \frac{2K\lambda}{\sqrt{(\frac{d}{2})^2+y^2}}\left(\frac{y}{\sqrt{(\frac{d}{2})^2+y^2}}\right)$$

$$\frac{4Ky\lambda}{(\frac{d}{2})^2+y^2}$$

$$\vec{E} = \frac{4Ky\lambda}{(\frac{d}{2})^2+y^2}$$

26.CQ.3)



$E_3 = E_4 > E_2 > E_1$

Due to density of lines